

Pleural Aspergillosis: A Rare Presentation of Fungal Infection

Plevra Aspergillozis: Nadir Görülen Bir Mantar Enfeksiyonu

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Abstract

Fungal infections accounts for less than 1% of all pleural effusions and rare causes of empyema. Herein, we report an immunosuppressed case of aspergillus empyema thoracis with pneumothorax. A 63-year-old female presented with complaints of progressive shortness of breath and right-sided chest pain. Radiological examination revealed a pneumonic consolidation in the right middle lobe. Aspergillus was grown in the sputum culture. Repeated scans showed right hydropneumothorax which was treated with intercostal drainage. She underwent surgery due to persistent air leaks, multi-loculated empyema, and unexpanded lung. Total right pleurectomy (decortication) was performed. She was discharged after 25 days on oral voriconazole which was continued for three months. It can be challenging to treat fungal empyema. Clinical suspicion and early administration of anti-fungal agents with surgical interventions kind of pleural drainage or pleurectomy may be helpful in improving the outcome.

Key words: *Aspergillus, Empyema, Fungal Infections.*

Özet

Mantar enfeksiyonları tüm plevral efüzyonların %1'den daha azından sorumludur. Nadiren ampiyeme neden olurlar. Aspergillus'a bağlı ampiyem ve pnömotoraks gelişen immünsupresif bir olguyu sunmayı amaçladık. Altmış üç yaşında kadın hastada ilerleyici bir nefes darlığı ve sağ göğüs ağrısı şikâyetleri mevcuttu. Radyolojik incelenmesinde sağ orta lobda pnömoni tespit edildi. Ampirik antibiyotik tedavisi başlandı. Balgam kültüründe aspergillus üredi. Kontrol incelemesinde sağ hidropnömotoraks tespit edilen hastaya interkostal drenaj yapıldı. Hasta, uzamış hava kaçağı, mültiloküle ampiyem ve akciğerin ekspansiyon kusuru nedeniyle ameliyata alındı. Komple sağ dekortikasyon yapıldı. Ameliyat sonrası dönem sorunsuz geçti ve hastanın genel durumu düzeldi. Yirmi beş gün sonra taburcu edilen hastaya üç ay boyunca ağızdan vorikonazol tedavisi verildi. Fungal enfeksiyonların tedavisi zor olabilmektedir. Klinik şüphe, erken antifungal tedavi, plevral drenaj ve plevrektomi gibi cerrahi müdahalelerle iyi sonuçlar alınabilir.

Anahtar Sözcükler: *Aspergillus, Ampiyem, Fungal Enfeksiyonlar.*

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Fungal infections accounts for less than 1% of all pleural effusions and rare causes of empyema (1). Most of them are caused by the *Candida* species particularly in critically ill patients with a high mortality (2). The aspergillus empyema, one of the causes of fungal infections of the pleura, is an uncommon clinical entity with a high mortality often due to delayed or overlooked diagnosis and inefficient treatment. It was first described by Cleland in 1924. Aspergillosis is a large spectrum of diseases caused by members of the *Aspergillus* genus. *Aspergillus fumigatus* is the most commonly isolated species, followed by *Aspergillus flavus* and *Aspergillus niger* (3). *Aspergillus* has two forms, including conidiophores and hyphae. The fungus may grow in water, soil, some animals and plant materials. Infection of the lung is usually caused by direct inhalation of the spores. Although rare, it usually occurs in the presence of pre-existing lung disease or surgery such as pre-existing tuberculosis (87%), bronchopulmonary fistulas (74%), pleural drainage (56%), and lung resection (17%). Pleural aspergillosis is not characteristically associated with pulmonary aspergillosis in either its allergic, bronchopneumonic, or intracavitary forms (3-5). Herein, we report a case of aspergillus empyema thoracis with pneumothorax in an immunosuppressed patient.

CASE

A 63-year-old female presented with complaints of progressive shortness of breath and right-sided chest pain. She was being followed for hypothyroidism, sarcoidosis, primary hyperparathyroidism, and hypopituitarism due to granulomatous hypophysitis. She was previously used corticosteroids for two months. Thoracic computed tomography (CT) showed pneumonic consolidation in the right middle lobe (Figure 1). She was treated with antibiotics empirically for a short time of period, including imipenem. Bacterial cultures were sterile. There was *Aspergillus* spp. cultured sputum and intravenous voriconazole was initiated with a loading dose of 400 mg twice on the first day, followed by 200 mg twice daily. Her symptoms including dyspnea and chest wall pain improved after a two-week antifungal treatment. Repeated CT scan showed right hydropneumothorax in the right pleural space with pleural thickening (Figure 2). After the chest tube placement, purulent fluid drainage and massive air leak were seen. Pleural fluids were sent for bacteria, tuberculosis, and fungal cultures. Subsequently, *Aspergillus* spp. was grown in the pleural fluid culture. Pulmonary parenchyma did not expand enough to fill the space. Thus, the patient underwent surgery due to persistent air

leaks, multi-loculated empyema, and unexpanded lung. Complete right pleurectomy was done through the muscle sparing thoracotomy. The presence of *Aspergillus* hyphae was pathologically confirmed. The postoperative period was uneventful and her overall condition improved gradually. The patient was discharged after 25 days on oral voriconazole which was continued for three months. No side effects were noted. After four-month follow-up, the patient was still alive without recurrence.

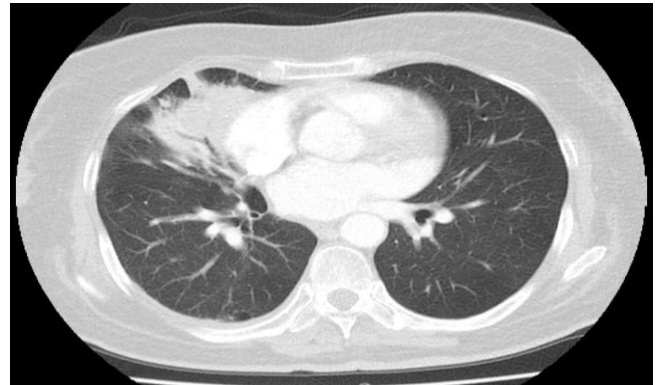


Figure 1: Thoracic CT on admission showing right Pneumonic consolidation



Figure 2: Repeated anteroposterior view of the chest X-ray and Thoracic CT showing right hydropneumothorax in the right pleural space with pleural thickening

DISCUSSION

Three distinctive patterns of aspergillus-related lung diseases are recognized: saprophytic infestation of airways, cavities and necrotic tissue e.g. aspergillomas; allergic manifestations such as extrinsic allergic alveolitis, asthma, allergic bronchopulmonary aspergillosis, bronchocentric granulomatosis and chronic eosinophilic pneumonia; and airway and tissue invasive disease called invasive aspergillosis (5). Patients who have Aspergillosis infection usually are immunocompromised, as in our case. The predisposing factors are diabetes, prior tuberculosis infection, chronic lung disease, receiving chemotherapy, and post-transplantation state (6). Management of aspergillosis empyema is very difficult, as it requires treatment over several months, particularly in patients with the following factors: diabetes, glucocorticoid therapy, chemotherapy,

acquired immune deficiency syndrome, hematologic malignancies (6) previous hospitalizations especially in ICUs, pre-existing pulmonary tuberculosis, bronchopleural fistula, pleural intubation or drainage, and lung resection (3,5).

There are many treatment options, including antifungal chemotherapy and surgical procedures. Although amphotericin B is the mainstay of the conventional antifungal medications, miconazole and nystatin can be used (3). However, due to its toxicity such as nephrotoxicity, phlebitis, hypokalemia, hypomagnesaemia, and anemia in 80% of cases, its use is limited. Voriconazole, one of the novel anti-fungals, is better tolerated than amphotericin B and is a broad-spectrum triazole which is active against *Aspergillus* species. However, the success rates continue to be low, only 20 to 27%, due to poor pre-morbid state and delayed diagnosis (5). In addition, systemic treatment has a limited response in patients with fungal empyema, as the pleural surface is thicker, the pleural fluid is more acidic, and more purulent fluid due to inflammation and an increased protein flux are present in the pleural space than in other conditions (7). Therefore, even in the long-term anti-fungal treatment of pleural Aspergillosis without surgery will probably fail, in particular, in patients with invasive Aspergillosis. Surgery is currently the treatment of choice in combination with anti-fungal drugs with considerable postoperative morbidity and mortality rates (8).

In conclusion, as removing surgically all the Aspergillosis-infected material is not possible and it can be difficult to treat fungal empyema, surgical intervention can provide an effective cure or faster recovery, despite all risks originating from its own. Anti-fungal medications, including intravenous voriconazole or amphotericin, should be considered with surgery in invasive fungal infections. As shown in our case, empyema of a fungal origin is associated with high mortality rates; however, clinical suspicion and early administration of anti-fungal agents with surgical interventions kind of pleural drainage or pleurectomy may be helpful in improving the outcome.

CONFLICTS OF INTEREST

None declared.

AUTHOR CONTRIBUTIONS

Concept - T.T.B., M.Ç., S.E.A., S.G.Ç., H.E.; Planning and Design - T.T.B., M.Ç., S.E.A., S.G.Ç., H.E.; Supervision - T.T.B., M.Ç., S.E.A., S.G.Ç., H.E.; Funding - M.Ç., S.G.Ç.; Materials - M.Ç., S.G.Ç.; Data Collection

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